Editorial

Interventional Neuroradiology in the United Kingdom

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Introduction

The success and failures of Interventional Neuroradiology as a specialty in the UK reflect the strengths and weaknesses of its National Health Service (NHS). The lack of economic competition between the clinical specialties has resulted in an unusual degree of cooperation between surgeons and interventionalists in the clinical care of patients. Nearly all patients are treated under the NHS not by the private sector thus any suggestion that UK interventionalists are motivated primarily by financial greed demonstrates a lack of knowledge of the national service [1]. The emphasis on social medicine leads to a cost effective, evidence based approach to patient management [2]. This sometimes results in a conservative approach, with a distrust of new treatments until their value has been rigorously tested. An example of this is the use of intracranial stents in the treatment of intracranial aneurysms. In a typical UK centre stents are used in 5% or fewer cases whereas in the US some centres are using stents in up to 60% of cases. Likewise the use of Onyx (MTI) for the treatment of aneurysms is virtually confined to one centre (Bristol).

Patient Management

The support of neurosurgeons for their interventional neuroradiological counterparts has led to a team approach in the management of neurovascular disease. Patient management varies in the individual centres but in a typical centre such as Edinburgh the day starts with an early morning management meeting.

This meeting is attended by neuroradiologists neurosurgeons, neurologists and neuroanaesthetists and supplemented by coffee. All the acute admissions along with their appropriate imaging are discussed and then a treatment plan for each patient is made. Patients with neurovascular disease such as aneurysmal subarachnoid haemorrhage thus receive the benefit of a wide opinion as to how and when they should be treated. At the same time the interventional procedures of the previous 24 h are reviewed for lessons learned and to predict any likely future problems, such as vasospasm, that might develop.

There is a multidisciplinary clinic for seeing new patients with cerebral aneurysms (e.g. unruptured aneurysms found incidentally) and also for the follow-up patients who have had a coiling of a cerebral aneurysm. Another clinic sees patients with AVMs or AV fistulas. This has a radiotherapist in attendance as well as an interventionalist, a neurologist and a neurosurgeon again so that the patient has the benefit of a multidisciplinary team opinion. The ISUIA Trial results, although much criticised, are used as the basis for the management decisions on unruptured aneurysms [3].

Screening for familial aneurysms and other high risk groups is a matter of much debate but is offered to those who have two or more relatives with confirmed aneurysmal subarachnoid haemorrhage. The morbidity of coiling unruptured aneurysms is usually quoted at 5% and the risks of embolization of an AVM at 5-8% [4]. But clearly many factors are taken into account before advising on treatment risks, such as the site and the morphology of lesion, the centres own audited results and improving technology.

An interesting development is the increasing role of the neurologist in the day to day management of good grade subarachnoid haemorrhage and of AVM patients. In this respect, the UK is now moving towards the Dutch model of treatment of neurovascular disease. The good grade patients are now admitted under the neurologists in some centres.

Science

The insistence of the clinicians on having robust evidence to underpin their practice has led to a number of randomised controlled trials being set up in the UK. These are difficult and expensive to set up in countries where doctors are rewarded by the number of patients treated. But the ethos of the NHS is utilitarian -"the greatest good for the greatest number"- as opposed to other health systems which allow individuals a greater role in choosing their treatment. This philosophy is underpinned by an evidence based approach to the practice of medicine. Thus there was initially a reluctance to allow patients to demand coiling as the treatment of choice for their cerebral aneurysms on the basis of the low quality of evidence provided by case reports and case series. As soon as ISAT was stopped and the results published there was an immediate change in all the major ISAT participating neuroscience centres to a policy of coiling for all suitable patients. It can be seen in the large ISAT centres the change resulted in a 48% coiling rate increasing to 85% in six months (figure 1).

The aggregation of neurosciences centres into larger units also helps produces superior results. A finding emphasised by the Bardach study [5] which reported in hospital mortalities of up to 49% in Californian Hospitals that low numbers of cases were treated. The UK national audit of subarachnoid haemorrhage undertaken by the Society of British Neurosurgeons found an in-hospital mortality overall of 8% (whether treated by endovascular or by surgery). Although the two series are not necessarily comparable it does support the move towards larger centres seen in the UK.

Training

The training of UK Neurointerventionalists has traditionally been by apprenticeship in an established unit. The centres most famous for training are Newcastle and Oxford and many of the UK neurointerventionalists were trained by Anil Gholkar or by James Byrne and Andy Molyneux.

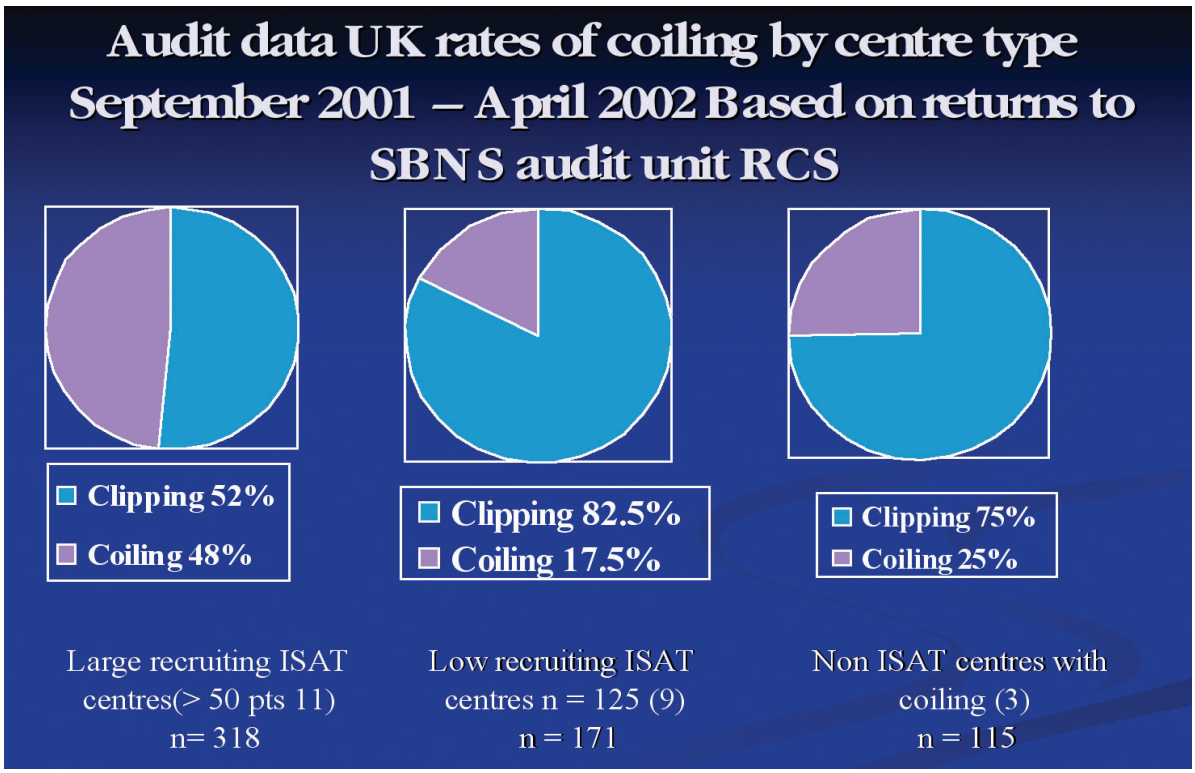
The British Society of Neuroradiology (BSNR) has laid down guidelines for training; trainees should have participated in at least 80 procedures during training taking the lead in at least a third [6].

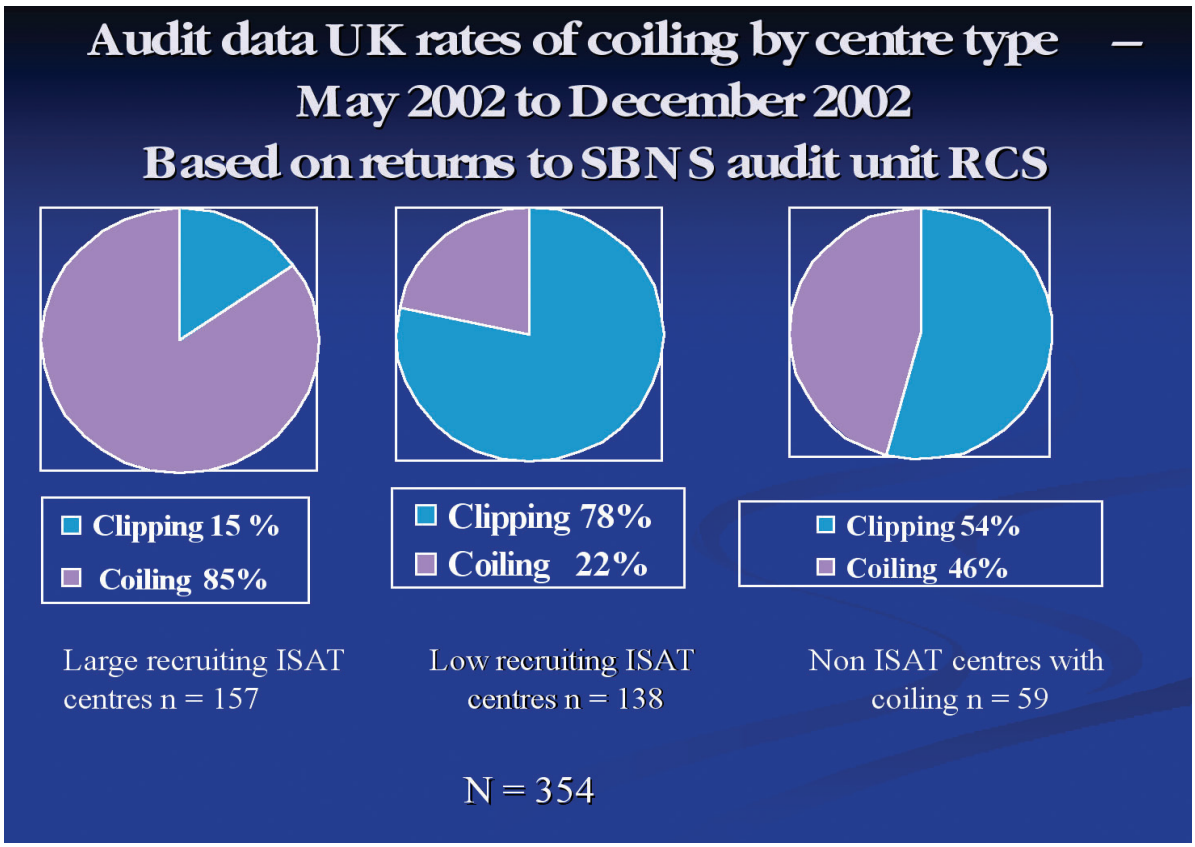
These figures are in line with those of other similar countries. There is a Masters degree organised by Oxford (James Byrne) which consists of a year of practical instruction combined with weekly tutorials. The course has a rigorous examination comprising three written papers, a thesis and an oral examination. Trainees are also actively encouraged to visit other centres both in the UK and abroad and many have been graciously welcomed by the editor at Bicêtre. Others have been on the Masters course held in Thailand and benefit from the firm grounding in the anatomical and embryology obtained there.

The UK has a very active interventional group (UKNG). There are regular meetings which are of high quality and with lively discussion. Indeed these are now attended by a number of visitors from abroad (even allowing the French to invade occasionally). The trainees form an important part of this group and are encouraged to present interesting cases and case series: this is not quite as intimidating as presenting at Val D'Isère.

The training of neurointervention in the UK is not perfect. On account of the shortage of specialists, appointments have sometimes been

Figure 1 Effect of the ISAT Trial result. (figure courtesy of Dr. A Molyneux)


Audit data UK rates of coiling by centre type
September 2001 – April 2002 Based on returns to
SBNS audit unit RCS
Clipping 52%
Coiling 48%
Clipping 82.5%
Coiling 17.5%
Clipping 75%
Coiling 25%
Large recruiting ISAT centres(> 50 pts 11) n= 318
Low recruiting ISAT centres n = 125 (9) n = 171
Non ISAT centres with coiling (3) n = 115


Audit data UK rates of coiling by centre type –
May 2002 to December 2002
Based on returns to SBNS audit unit RCS
Clipping 15 %
Coiling 85%
Clipping 78%
Coiling 22%
Clipping 54%
Coiling 46%
Large recruiting ISAT centres n = 157
Low recruiting ISAT centres n = 138
Non ISAT centres with coiling n = 59
N = 354

made prior to the completion of training. Lack of experience has then resulted in outcomes that are not as good as expected by the trainee with subsequent psychological trauma. Indeed several radiologists trained or partially trained in intervention have reverted to cross sectional imaging.

Interventional neuroradiology involves considerable stress, long hours and commitment, together with less financial reward than many other specialties. Many of us are starting to worry where the next generation of UK interventional neuroradiologists will come from.

UKNG - *The U.K. Neurointerventional Group*

This Group meets twice a year. The format has changed as numbers have increased. It initially was an informal meeting where interesting cases were presented and complications discussed. It has now evolved into a more formal meeting with a more scientific emphasis. Centres often review their experience of a new technique such as intracranial stenting. Occasionally there is a theme and all centres are asked to bring their experience with a disease or technique. Last year the use of Onyx in aneurysms was reviewed. Most centres presented disappointing results with this technique and it was decided that it was probably a technique that should be used only by one very experienced group member if at all. Policy is often discussed and currently paediatric neurointervention is being considered by the group with the aim of establishing just two centres in the UK in order to maximize the experience in rare conditions such as vein of Galen malformations. UK neurointerventionalists are a tight-knit group. The meetings are open and discussion typically honest.

The relationship of the UKNG with industry is perhaps unique as many of the company representatives and directors have worked for a long time with the UKNG to further the group's aims. Thus several companies in the UK now sponsor RCTs (Randomized Controlled Trials) of their new products whilst leaving the trial management and data collection in totally independent hands. Thus the HELPS trial comparing the treatment of aneurysm by Hydrocoils with bare platinum is funded by industry, but the principle investigator is Dr Phil White (Edinburgh). The trial has an independent steering committee, independent monitoring committee and the results are independently assessed by the core laboratory of Montreal. Likewise there are RCT protocols being worked on to compare Cerocyte (Micrus Corp) with bare platinum for ruptured cerebral aneurysms and for angioplasty versus best medical treatment for the management of clinical vasospasm. These trials represent a significant investment in our science.

BIG - *Brain Interface Group*

This is small group consisting of just eight of the most active neuroscience centres. It meets yearly, acting as a forum for neurosurgeons and neurointerventionalists to share experiences, particularly of difficult cases that require input from both specialties. It has helped to cement the good working relationships between the two specialties, encourages joint research such as ISAT and seeks to lead opinion on the future developments in patient management.

BSNR - *The British Society of Neuroradiology*

This is the parent society to which all UK neurointerventionalists belong. It is a very active society. It acts with the Royal College of Radiologists to lay down the standards of training, equipment and facilities required for the safe and effective practice of neuroradiology [7]. The highlight of the year is its annual meeting which is held in a different city each year. The scientific abstracts are published in Neuroradiology and the quality of the interventional and cross-sectional neuroradiology science is remarkably high. This year the James Bull lecture will be given by Nobel Laureate Sir Peter Mansfield. A number of radiologists from Europe and the US attend and anyone interested in the current state of British neuroradiology would be welcomed [8].

References

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British Society of Neuroradiology Annual Meeting 2005 is in Edinburgh. Applications can be made to the author.

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